

## SECTION II

### Geology of the Project

The proposed project alignment begins approximately 3.5 miles west of Oldsburg and runs eastward to a point where it ties into K-13 approximately 0.5 mile south of Fostoria. It is approximately 8.5 miles in length and with two exceptions, parallels the present roadway throughout its entire length. The exceptions are through Oldsburg where it coincides with the present roadway and the easternmost one mile which runs across country to K-13.

The rolling topography of the project area is typical of an early mature stage of erosion developed in and on glacial till and bedrock units. The drainage of the area consists of numerous seasonal gullies flowing generally southward into major drainage patterns which in turn empties into the Blue River. These gullies are V-shaped in profile and are developed in a dendritic pattern upon the land surface.

In Geological Survey Bulletin #1060-C published in 1959 by the United States Department of Interior titled Geology and Construction Material - Resources of Pottawatomie County, Kansas, the project area is referred to as "dissected till plain" and/or "attenuated drift border". The unconsolidated glacial material blanketing this area was deposited during the Kansas glacial and post-Kansas glacial age. Much of the material of the project area is classified as a loess. This loess material was derived from Kansas glacial age sediments by the reworking action of wind and water. The wind constituted the principle transporting agent of the silts and clays that were deposited over a wide upland area during post-Kansas glacial time.

At the present time the thickness of this loess material ranges from 0.0 to 40.0 feet in thickness but due to erosional processes active between the time of deposition and now, it is safe to assume that many more feet of material was deposited originally. A 1.0 to 2.5 feet topsoil has developed on this loess material and the seasonal gully floors have been blanketed by a fairly thin alluvial layer during post glacial time.



Localized pockets of poorly sorted, dirty sands and some scattered glacial erratics were encountered throughout the silt and clay deposits. These sand pockets are glaciolacustrine in nature and were deposited in ponds and lakes in front of the glacier between cycles of eolian deposition.

Due to the thickness of the glacial deposits along most of the project alignment bedrock units of the Chase group will be encountered only along the first 2.0 miles, between 2.5 and 3.5 miles of the eastern end and at the very end of the project. Regional dip of the bedrock units is to the west at 12.0 to 15.0 feet per mile as an average but many localized increases or decreases and even reversals in this dip may occur.

Local changes in thickness and lithology of the bedrock units were noted, however, they are minor in nature and will have little effect on the geo-engineering aspects of the project. Many of the limy shales and shaly limestones encountered are so similar in texture, color and composition that it is difficult to pick a distinct break and any change in lithology, even though only a slight increase or decrease in lime content, may cause a limy shale to appear, in soundings and exposures, as a shaly limestone or vice versa. These changes will create no design or construction problems because the Geo-Engineering Aspects section of the report will cover, in detail, the excavation and backslope requirements of all bedrock units encountered through this area. The same geologic formations as present on the proposed project may be observed in fresh cuts on K-16 immediately west of this project.

The "rimrock" portion of the Fort Riley Limestone Member and the Florence Limestone Member are the main water producers of this area, however, the Towanda Limestone Member may produce water locally. Numerous seasonal seeps and several springs are present along the outcrop edges of both the Fort Riley and Florence Limestone Members. One very productive perennial spring that is flowing from the base of the "rimrock" is present 56 feet right of centerline in the vicinity of Station 585/00. Due to its close proximity to centerline, this spring will be given special consideration in Section III of the report.